REMARKS/ARGUMENTS

Claims 1-14 are pending in this application of which claims 1, 2, 6-8 and 13-14 have been amended.

The Rejection Under 35 USC §112, Second Paragraph:

Claim 8 is rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly pointing and distinctly claim a subject matter which applicant regards as the invention. Although applicant felt that this claim was sufficiently definite to particularly point out and distinctly claim subject matter which applicant regards as the invention; applicant, nonetheless, has amended this claim in an effort to provide more ready understanding of claimed embodiments of applicant's invention and in an effort to more readily advance the prosecution of this application to allowance.

For example, applicant has re-written the second limitation in independent claim 8 to recite "amplifying a first frequency range of the audio signal received that substantially consists of first speech formant frequencies and amplifying a second frequency range of the audio signal received that substantially consists of second formant frequencies of the audio signal." Additionally, applicant has further recited that "the amplifying of the second frequency range is to be performed differently from the amplifying of the first frequency range." Applicant submits that this claim as now amended meets the requirements of 35 USC § 112 second paragraph.

Further, applicant has provided grammatical correction to independent claim 8 as was suggested by the Examiner, wherein the sixth limitation now recites "controlling the gain for the amplifying of the second frequency range based on the level sensed…"

The Rejection Under 35 USC § 103(a):

Claims 1, 6, 8 and 10-13 are rejected under 35 USC §103(a) as being unpatentable over Miller (US patent number 5,506,910).

Applicant respectfully traverses.

Miller discloses of an automatic equalizer and a method of operation that may automatically adjust relative amplitudes for frequencies bands within a given audio spectrum effective for compensating a room or concert hall. Miller teaches that a plurality of narrow band reference signals of different frequencies may be sequentially or randomly added to an electrical program signal that is amplified by a power amplifier and broadcast from a speaker. Miller further teaches that the magnitudes of the narrow band reference signals within the broadcast audio program may be detected an measured, by which an automatic equalization program may operate to produce a desired frequency response in the amplification system based on the magnitudes of the respective signals determined. Accordingly, a particular room or concert hall of frequency response may be compensated and automatically equalized by the equalizer so as to compensate for the frequency response of the hall or room.

In contrast, independent claim 1 recites a speech dedicated stable amplifying system to increase speech intelligibility. A first amplifying circuit linearly amplifies a first frequency range of an audio signal that substantially comprises first speech formant frequencies. A second amplifying circuit linearly amplifies a second frequency range of the audio signal that substantially comprises second speech formant frequencies. Further, the amplification of the first frequency range is different from the amplification of the second frequency range and is to emulate at least one acoustic property of a passive device of a spectral emphasis for emphasizing the second speech formant frequencies more favorably relative to the first speech formant frequencies so as to enhance speech intelligibility. A mixer combines the first and the second frequency range signals into an amplified audio signal for an output device to transmit the audio signal.

While Miller teaches simply of automatic equalizer for facilitating equalization or normalization of an amplifying system with respect to the dynamics for a room or concert hall; claim 1 of the present application is directed to a speech dedicated stable amplifying system. For the speech dedicated stable amplifying system, an audio signal of first and second speech formant frequencies is amplified by respective first and second amplifiers. The difference in the amplifying emulates a passive device for enhancing speech

intelligibility via emphasis of the second speech formant frequencies with respect to the first speech formant frequencies.

Applicant has observed, for example, that speech intelligibility may often be improved by ear cupping or an ear trumpet (which is a passive device used by a patient). The applicant has determined that speech communication usually occurs within or around the 40 to 60 phonon level. See, for example, the present disclosure around paragraph [0039].

With reference to the diagram of FIG. 3, applicant has characterized a spectral range and relative signal strength that could be attributed a "speech area". Applicant has described such "speech area" of given centroid frequencies of first and second speech formants. Applicant further noted that a patient's sensory neural level for one of the speech formant frequencies may generally be in a 40 to 50 phons level at around 650 Hz. However, the higher frequencies of proximity to about 2000 Hz may be elevated for the patient. Accordingly, the loudness might be at around 0 to 10 phons. Accordingly, the second speech formant levels as associated with typical speech for the sensory neural patient may effectively equivalent to a loudness level of a whisper. Accordingly, there might be a diminished perception for frequencies of the second speech formant. See, for example the disclosure at around paragraphs [0041]-[0042].

Applicant has further discerned, with reference to FIG. 2 of this disclosure, that the relative acoustic gains for first and second speech formants may be impacted by employment passive ear cupping or an ear trumpet accessory. By using their hand to cup their ear or using an ear trumpet accessory, the patient may bring about an enhancement of frequencies associated with improved speech intelligibility. Accordingly, applicant proposes an embodiment for emphasis or enhancement of second speech formant frequencies relative to first speech formant frequencies so as to lend similar improvements in speech intelligibility.

Applicant respectfully submits however that Miller is concerned primarily with automatic normalizing or equalizing frequency characteristics associated with a room or

concert hall. Miller does not disclose or suggest of given frequency ranges associated with *speech intelligibility* such as first or second speech formant frequencies as presently disclosed and referenced by applicant embodiments of the present invention as now recited in independent claim 1. Additionally applicant further submits that there is no disclosure or suggestion in Miller of simple first and second amplifiers of a different amplification so as to emulate acoustical properties of a passive device for spectral emphasis second speech formant frequencies relative to the first so as to enhance speech intelligibility.

Because Miller does not teach, disclose or suggest of such features of applicant's present invention as presently recited in independent claim 1, applicant submits that claim 1 is patentable over Miller. Likewise, it follows that associated dependent claims 2-7 similarly would be patentable over Miller at least for reason of being dependent upon a patentable base claim in addition to their own respective features.

Dependent claim 2 further recites that the difference in amplification between the first and second speech formant frequencies may emulate a passive device of the group consisting of an individual's ear cupping and an ear trumpet aid.

Applicant has determined that ear cupping and ear trumpet aids may be effective for emphasis of second speech formant frequencies for lending enhanced speech intelligibility. Accordingly, the first and second amplifiers are recited as providing different amplification of the first and second speech formant frequencies so as to emulate ear cupping or an ear trumpet for enhanced speech intelligibility.

Because Miller does not disclose or suggest of such ear cupping or ear trumpet for improvement of speech intelligibility by way of first and second amplifiers as presently recited in dependent claim 2, applicant respectfully submits that dependent claim 2 is patentable over Miller and independently of independent claim 1. Likewise, it follows that associated dependent claims 3-5 similarly would be patentable independently of the patentability of independent claim 1

Independent claim 6 recites a public announcement system for enhanced speech intelligibility which comprises, amongst other limitations, recitation of amplification of first frequency range formant frequency by a first amplifier and amplification of a second frequency range of second formant frequency by respective first and second amplifiers. These first and second amplifiers are weighted differently to emulate at least one acoustic property of a passive device for spectral emphasis of the second speech formant frequencies relative to the first speech formant frequencies and to enhance components for speech intelligibility. Similarly to reasons presented above relative to claim 1, applicant submits that because Miller does not disclose or suggest of such public announcement system for enhanced speech intelligibility with emphasis of second formant frequencies relative to first so as to emulate a passive device for speech intelligibility, applicant submits that the public announcement system for enhanced speech intelligibility of claim 6 is patentable over Miller.

Dependent claim 7, dependent upon claim 6, further recites that the passive device that is to be emulated is to comprise one of the group consisting of hand operated ear cupping and a ear trumpet. In liking to the arguments presented above, applicant respectfully submits that Miller mentions nothing of ear cupping or an ear trumpet, nor does Miller appear to mention concern of speech intelligibility. Applicant submits therefore that Miller provides no teachings or suggestions for amplification by way of first and second amplifiers of different weighted amplifications for respective first and second speech formant frequencies, whereby they emulate ear cupping or ear trumpet for emphasis of second speech formant frequencies and for enhanced speech intelligibility. Accordingly, applicant submits that dependent claim 7 is patentable over Miller, and independently of independent claim 6.

Independent claim 8 recites of a method of enhancing speech intelligibility in a public address system which includes receiving an audio signal and amplifying a first frequency range of the audio signal that consists of first speech formant frequencies. A second frequency range of the audio signal received may also be amplified for the second frequency range that substantially consists of second formant frequencies of the audio

signal. The amplifying of the second frequency range is performed differently from that for the first frequency range. An inaudible signal tone may be injected and mixed with the audio signal. A level of the signal tone may be sensed from the audio signal received and used to control a gain for the amplification of the second frequency range based on the level of the signal tone that is sensed. Further, the gain for amplifying the second frequency range may be controlled so as to substantially prevent regenitive oscilation of the audio signal and to amplify the second formant frequencies without creating howl. Further, the difference in amplifying of the second speech formant frequencies may provide emphasis of the second formant frequencies for enhanced speech intelligibility.

Applicant respectfully submits that Miller discloses of elaborate automated audio equalizer for compensating a room or concert hall but fails to disclose or suggest of emphasis of second speech formant frequency relative to first speech formant frequency by which to enhance speech intelligibility within a public address system as presently recited in independent claim 8. Accordingly, applicant submits that independent claim 8 is patentable over Miller.

Additionally, applicant submits that the teachings of Miller may appear to provide for insertion of signal tones of and within the audio signal range so as to provide capability of compensating for multiple frequencies through the spectra and frequency response associated with the particular room or concert hall that is being equalized. In contrast, independent claim 8 recites that an inaudible signal tone be injected into the signal tone and that the level of such an inaudible tone be used to control amplification or amplifying of the second frequency range based on the level of the signal tone sensed. Accordingly, applicant respectfully submits that this independent claim 8 is not the same as nor suggested by Miller so as to be patentable over Miller for reason of Miller further teaching away from features of this embodiment of applicant's.

Claims 2-4, 7 and 14 are rejected under 35 USC§ 103 (a) as being unpatentable over Miller in view of "acoustic systems in biology" of Fetcher.

Applicant respectfully traverses.

Fletcher teaches of a variety of different equations and shapes that may be associated with parabolic, conical and exponential horns. Fletcher suggests that some of these features could be similar or striking to many of the auditory systems of mammals. Accordingly, applicant respectfully submits that while Fletcher may appear to characterize or model the Pinnae of auditory systems of given mammals by way of the simplified understanding of either parabolic, conical or exponential horns, the teachings of Fletcher appear to be absent analysis of or suggestive of enhancements of speech intelligibility.

Applicant respectfully points out that Fletcher does not appear to be suggesting of any particular preference of first speech formant or second speech formant frequency ranges as presently disclosed for embodiments of applicant's invention and as recited in the claims. Furthermore, applicant respectfully submits that Fletcher provides no suggestion that the emphasis of one over the other might offer improved speech intelligibility. Finally, applicant finds no teaching, disclosure or suggestion within Fletcher that the passive solutions of ear cupping or employment of ear trumpets might likewise provide qualities that might be capable of emulation for enhancing speech intelligibility.

Accordingly, applicant respectfully submits that the teachings of Fletcher lend nothing further of particular significance over that of Miller by which to teach, disclose, or suggest of applicant's embodiments of invention as presently recited in the pending claims. Accordingly, applicant respectfully submits that the claims 2-4, 7 and 14 as now amended are patentable over Miller and Fletcher individually or in their combination. Neither Miller nor Fletcher suggests of the emulation of ear cupping or emulation of an ear trumpet. Accordingly, what neither Fletcher nor Miller teach individually cannot be said to come to fruition in their collection. In other words, lacking an element associated with embodiments of applicant's present invention, a combination of Miller and Fletcher similarly cannot be said to encompass or include such feature that neither one discloses or supports.

Likewise, applicant respectfully submits that although various references may be combined, they may not be combined indiscriminately. Given criterion must exist by which to determine whether one of given skill in the art would by use of the references before him make a combination of elements as presently claimed. It is not enough to view the art with benefit of applicant's disclosure. The art as applied should be viewed by itself, or with benefit of an artisan's skilled thought, to see if such artisan would be led to doing what applicant has done.

Applicant submits that an artisan that may have the various cited references before them, and not cognizant of applicant's disclosure, would not be informed of the solution provided by applicant. In other words, applicant submits that the prior art references do not appear to suggest of applicant's solution for emphasis of second speech formants frequencies for enhanced speech intelligibility per the embodiments of applicant's present invention as recited in claim 4. Furthermore, applicant submits that even if they were combined, the ordinary artisan would interpret them to teach away from embodiments of applicant's present invention, that is teaching instead of room or concert hall equalization and of multi-channel complicated analysis and compensators.

Furthermore, applicant submits that neither Miller nor Fletcher teach of hand ear cupping, ear trumpet or of associated benefits to speech intelligibility via first and second speech formant frequencies. Applicant submits therefore, that even if the referenced art were combined, and more particularly via the teachings thereof, the combinations thereof would not anticipate embodiments of the applicant's present invention as now presently recited in the claims.

The Rejection Under Obvious-type Double Patenting:

Claims 8-14 were rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 6,647,123.

Applicants submit concurrently herewith, in accordance with 37 CFR §3.73(b), a Terminal Disclaimer together with an accompanying fee by EFT under 37 CFR §1.20(d) of $70.00 as a small entity.

In view of the above amendments and remarks, applicant submits that the present application is now in condition for allowance and respectfully requests such action for this application.

If a discussion with the Examiner would be helpful, applicant encourages the Examiner to contact the undersigned.

Respectfully submitted,

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